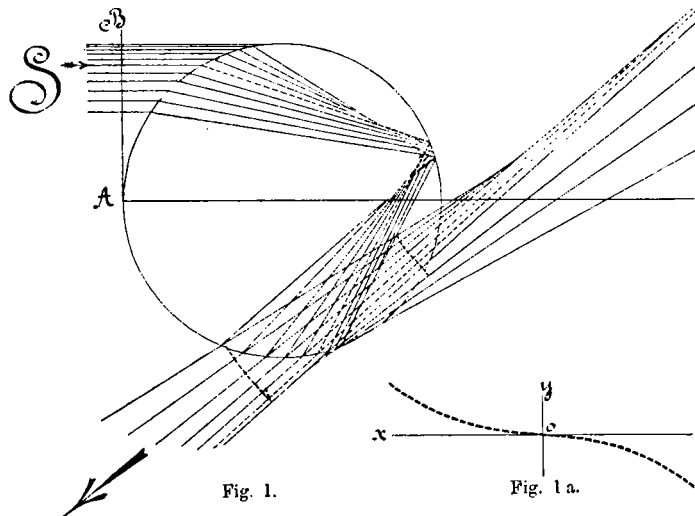


of this grade should not be introduced into the American schools to the great advantage of our pupils. The advantage would consist, not in the facts and statistics with which their memories are burdened, but in the logical reasoning processes by which the pupil is led to dwell only on the important factors that control the meteorological phenomena.—C. A.

#### PERNTER'S THEORY OF THE RAINBOW.

On page 503 of the MONTHLY WEATHER REVIEW for November, 1904, we published an article by Rev. D. Hammer, S. J., on "Airy's theory of the rainbow." Prof. J. M. Pernter has called the attention of the author to the fact that fig. 2, page 505, might convey the erroneous idea that all the rays when prolonged meet in one point.



FIGS. 1 and 1a.—Pernter's theory of the rainbow.

The exact path of these rays has been worked out very carefully and laboriously by Professor Pernter in his memoir entitled "Ein Versuch, der richtigen Theorie des Regenbogens Eingang in die Mittelschulen zu verschaffen," and the accompanying figs. 1 and 1a from this work, which we publish at Mr. Hammer's suggestion, explain more accurately than that on page 505 the exact paths followed by the rays and the method of their interference so as to form caustics and bands of colors. Professor Pernter has made the whole process of reflection and interference so plain by graphic constructions that his work, which ought to be translated among the classics of science, is commended to high school teachers throughout the country.—C. A.

#### METEOROLOGY IN HAITI.

Under date of February 16, Prof. R. T. Constantine, Professor of Physics in the St. Louis Gonzaga College, Port au Prince, Haiti, informs the Chief of the Weather Bureau that he has organized in that Republic a society which has adopted the name "The Astronomical and Meteorological Society of Port au Prince." This society has been officially approved by the Minister of the Interior, who promises the hearty support of the government. The first business of the society will be to establish meteorological stations at different points in the Republic, in order to determine the climatological elements proper to each of these localities and to the country in general. In the beginning only thermometric stations will be established, where maximum and minimum temperatures, winds, hydrometeors, thunderstorms, and earthquakes will be observed. In order to equip ten climatological stations Professor Constantine hopes that the U. S. Weather Bureau will contribute the necessary apparatus. But as this is quite beyond the legal power of the Chief of Bureau, we may express the hope that the friends of science in America will come to

the help of this new enterprise. The study of climate in its relation to agriculture has been prosecuted for a century very diligently in the Temperate Zone, but very little is known of this important subject with reference to tropical climates.

It may, however, be added that Port au Prince, Haiti, will be established as a regular telegraphic reporting station of the U. S. Weather Bureau during the hurricane season. It will have the complete outfit of a first-class station, and will be installed by a regular Weather Bureau observer, and then left in charge of Professor Constantine.—C. A.

#### WEATHER BUREAU MEN AS INSTRUCTORS.

Mr. James L. Bartlett, Observer, Madison, Wis., on February 8 addressed 200 members of the Wisconsin Agricultural Experiment Association, composed of graduates of the College of Agriculture of the University of Wisconsin. He discussed the value of the Weather Bureau to the farmers and explained the use of the weather map.

Beginning with next fall, Mr. Bartlett's course at the University of Wisconsin will extend throughout the college year, the second semester being devoted more particularly to the study of climatology.

Mr. S. S. Bassler, Local Forecaster at Cincinnati, Ohio, on February 11 delivered an address on "Weather" before the Oxford Farmers' Institute at Oxford, Ohio.

Prof. Henry J. Cox, Chicago, Ill., has begun a series of lectures in that city and vicinity, illustrating with lantern slides the movements of storms, cold waves, and other atmospheric conditions and their effects. He treats in a general way the forecast work of the Weather Bureau. The first lecture was delivered before the Church Men's Club at Englewood, Ill., on February 20; the second was given on February 28 at the regular monthly meeting of the Chicago Academy of Sciences.

The executive committee of the Geographical Society of Chicago, which has decided to publish a bulletin on the teaching of meteorology, has requested Professor Cox to act as chairman of a committee for the preparation of this bulletin.

Mr. W. C. Devereaux, Assistant Observer, Ithaca, N. Y., will give a course in agricultural meteorology and climatology at the Agricultural College of Cornell University during the last half of the present school year. The course includes one lecture and two quiz and laboratory periods each week, and the following lectures will be given during the term:

1. Temperature. Radiant energy; effect of different rays upon vegetation; importance of diffused daylight for vegetation; reflected heat; terrestrial radiation; soil temperatures; sensible temperatures.
2. Precipitation. Causes of unequal distribution and effects of; data to be considered; capacity of soils; plant requirements; water for irrigation; and the value of reliable observations.
3. Floods. Classes; river basins; sources of flood water; rise, crest, velocity, and methods of predicting stages.
4. Weather. Defined; changes produced by passage of cyclones and anticyclones; hurricanes; cold waves.
5. Weather maps. Method of preparing daily map; practise in preparing.
6. Forecasting the weather. Method employed; meaning of terms used; results obtained.
7. Practise forecasting. Practise forecasts made from weather maps and compared with resulting conditions; special types considered.
8. Long-range forecasts. Defined; relative effect upon the weather of different factors; results.
9. Climate. Defined; effects of latitude, altitude, oceans, forests, etc.
10. Climate and plants. Distribution and development of plants as depending on climate.
11. Climate and man. Effects of climate on the human race.
12. Meteorology in the schools. The extent to which meteorology is taught in the schools to-day and how it can be increased.
13. The meteorological services of the world. A history of the different services and their importance.

Mr. C. W. Ling, Assistant Observer, Havre, Mont., reports that the superintendent of public schools, with the high school class, visited the local Weather Bureau office on February 24 and received instruction in the use and construction of meteorological instruments, the work of the Weather Bureau, and methods of forecasting.

Mr. George A. Loveland, Section Director, Lincoln, Nebr., on February 14 delivered a lecture, "How the weather is made," before the Men's Club of the First Congregational Church.

Mr. E. H. Nimmo, Observer, Sandusky, Ohio, states that the class in physical geography visited the office in two sections on February 21 and 23. They were instructed in the use of instruments, the preparation of the daily weather map, and methods of forecasting.

Mr. George Reeder, Section Director, Columbia, Mo., is giving a course of lectures on meteorology and climatology at the University of Missouri.

Mr. Edward B. Richards, Section Director, Little Rock, Ark., delivered three lectures during February, at the local office of the Weather Bureau, to classes in physical geography from the Cramer School and the Peabody High School. The instruction consisted in an explanation of the instruments, weather maps and charts, and the value of the Weather Bureau records, with some remarks on forecasting and the general work and methods of the Bureau.

Mr. H. W. Richardson, Local Forecaster, Duluth, Minn.,

spoke on February 28 to the "Physiography Section" of the Duluth State Normal School, and on March 6 to the 35 pupils of the class in physical geography of the Superior, Wis., High School. In both cases the instrumental apparatus was thoroughly explained, followed by a lecture on forecasting and the general work of the Bureau.

Mr. George N. Salisbury, Section Director, Seattle, Wash., is giving a course of two lectures per week in practical meteorology at the University of Washington.

Mr. Richard H. Sullivan, Observer, Grand Junction, Colo., delivered a series of three lectures, illustrated with lantern slides, before the high school students and friends of the school, from 200 to 300 being in attendance. The lectures were as follows:

January 20. The atmosphere; pressure, temperature, moisture, winds, general circulation.

February 17. The Weather Bureau; history, explanation of apparatus, discipline, and detail work.

March 17. Four types of storms common to the United States—cyclones (warm waves and cold waves), hurricanes, thunderstorms, tornadoes; forecasting; and the Weather Bureau's relation to public interests.

Mr. John R. Weeks, Observer, Macon, Ga., on February 20, delivered a lecture, illustrated with lantern slides, before the Current Topics Club of Macon. On February 22 he addressed the Georgia State Fruit Growers' Association, in session at Macon. The lectures were on meteorology; the Weather Bureau and its work; the weather, what it is and how forecast; practical application of weather forecasts. In the lecture to the fruit growers particular stress was laid upon cold waves and the protection of fruit from frosts and injurious temperatures.—*F. O. S.*

## THE WEATHER OF THE MONTH.

By Mr. WM. B. STOCKMAN, Chief, Division of Meteorological Records.

### PRESSURE.

The distribution of mean atmospheric pressure is graphically shown on Chart VIII and the average values and departures from normal are shown in Tables I and V.

The mean barometric pressure for the month was highest over the slope and central valley regions, and the lowest over the southern Plateau and south Pacific regions.

The maximum mean readings ranged from 30.30 to 30.33 inches and were reported from the eastern parts of Kansas, Nebraska, South Dakota, and the western portions of Iowa and Missouri. The minimum mean reading was reported from southwestern California.

The mean pressure for the month was below normal in the western portions of Oregon and Washington, in Nevada, excepting the extreme northeastern portion, extreme southwestern Utah, western Arizona, and California, with the greatest negative departures,  $-1.0$  to  $-1.4$  inch, over California. In all other districts the mean pressure for the month was above the normal, and over the greater portion of the area of positive departure the changes were quite marked. Over northwestern Texas, Oklahoma and Indian Territories, extreme western Missouri, Kansas, Nebraska, and central and western South Dakota, the departures ranged from  $+0.20$  to  $+0.25$  inch, the maximum departures being reported from central Nebraska and western Kansas.

Over New England, except Maine, the Middle Atlantic States, northern portion of the South Atlantic States, upper Ohio Valley and Tennessee, lower Lake region, and southeastern portion of the upper Lake region, the mean pressure for the month increased over that of January, 1905; in all other

districts it decreased from that of the preceding month. The increases in pressure were very slight, while the decreases were, as a rule, quite marked, and ranged from  $-0.10$  to  $-0.18$  inch over western Minnesota, the Dakotas, eastern Montana, western Colorado, northwestern New Mexico, southern Utah, southern Nevada, California generally, and northern Arizona.

### TEMPERATURE OF THE AIR.

The mean temperature for the month was above the normal in Arizona, Utah, Nevada, California, Oregon, western Washington, northern North Dakota, and northwestern Minnesota. In all other districts the mean temperature for the month was below the normal.

As a rule the positive departures were rather slight—the greatest being  $+4.2^{\circ}$  in southwestern California, and  $+5.1^{\circ}$  in northwestern Minnesota—while the negative departures generally were very marked, being  $-6.0^{\circ}$ , or more, over the greater portion of the area of deficient temperature, and from  $-10.0^{\circ}$  to  $-13.4^{\circ}$ , over Texas, except the extreme southwestern portion, Louisiana, except the extreme southeastern portion, Mississippi, northern Alabama, northwestern Georgia, Tennessee, Kentucky, southern Ohio, the southern and central portions of Indiana and Illinois, extreme southeastern Iowa, Missouri, except the extreme northwestern portion, Arkansas, Oklahoma and Indian Territories, Kansas, except the northeastern portion, and west-central Nebraska.

The mean temperature for the month was as low as any previously recorded during February at Atlantic City, N. J., Binghamton, N. Y., Block Island, R. I., Chattanooga, Tenn., Columbia, S. C., Fort Smith, Ark., Fort Worth, Tex., Indian-